

AMENDMENT TO CLAIMS

The following listing of claims will replace all prior versions and listings of the claims in the application:

1-41 (PREVIOUSLY CANCELLED)

42. (AMENDED) A [direction-agile antenna] system for use in establishing and maintaining wireless data links, the system comprising:

an antenna system capable of being selectively [oriented] configured to transmit or receive an electromagnetic signal in a plurality of selected patterns [directions]; and

a controller coupled to the antenna system and configured to transmit at least one polling request through the antenna system, detect one or more responses to the at least one polling request while the antenna system is [oriented] configured in at least two different selected patterns, determine a selected [direction] pattern for the [orientation of the] antenna system based on the responses to the polling request received while the antenna system is [oriented] configured in the at least two different selected patterns and transmit a [direction control] signal to the antenna system indicating the selected [direction] pattern for the antenna system.

43. (AMENDED) The system of claim 42 wherein said antenna system comprises a plurality of elements and at least one of the plurality of elements is configured to transmit an electromagnetic signal in a different [direction] pattern than another of the elements.

44. (AMENDED) The system of claim 43 wherein at least one of the elements is configured to be activated while other elements are switched off to transmit the electromagnetic signal in the selected [direction] pattern of transmission [of the antenna].

45. (AMENDED) The system of claim 42, wherein the antenna system comprises a plurality of elements and the controller is further configured to transmit the polling requests from all of the elements.

46. (AMENDED) The system of claim 42 wherein the controller is configured to transmit a first polling request while the antenna system is [oriented] configured in a first selected pattern and to transmit a second polling request while the antenna system is [oriented] configured in a second selected pattern [comprises a transceiver].

47. (PREVIOUSLY PRESENTED) The system of claim 42 wherein the controller comprises circuitry which is integrated with a surface on which at least one of the elements is disposed.

48. (AMENDED) The system of claim 42 wherein the controller is further configured to transmit a signal to the antenna system to scan [the antenna] in multiple [directions] patterns and detect a response to the polling request during the scanning of the antenna system.

49. (PREVIOUSLY PRESENTED) The system of claim 43 wherein at least some of the elements are arranged as a phased array.

50. (AMENDED) The system of claim 42 wherein said controller is further configured to store the selected pattern for later communication with a device which transmitted the one or more responses to the at least one polling request [antenna comprises a plurality of elements that can be separately activated and at least one reflector].

51. (AMENDED) A method of improving a wireless communication link using [a] an [direction-agile] antenna system having multiple patterns, the method comprising:

transmitting at least one request from the [direction-agile] antenna system;

scanning the [antenna beam of the direction-agile] antenna system in multiple [directions] patterns;

detecting responses to the request while the antenna system is [oriented] configured in at least two different selected patterns during the scanning;

determining a [direction] pattern of the antenna [beam] system of the [direction-agile] antenna system based on the detected responses; and
transmitting or receiving a signal from the [direction-agile] antenna system in the determined [direction] pattern.

52. (AMENDED) The method of claim 51 wherein the [direction-agile] antenna system comprises a plurality of elements and said at least one request is transmitted from all of the antenna elements of the [direction-agile] antenna system.

53. (AMENDED) The method of claim 51 further comprising [the step of] selecting a scanning speed for said antenna system which is different from the scanning speed of an additional antenna system in said communication link.

54. (AMENDED) The method of claim 51 further comprising the step of [selecting scanning angle increments] changing patterns for said antenna system at a rate which [are] is different from the rate at which patterns are changed by [scanning antenna increments of] an additional antenna system in said communication link.

55. (AMENDED) The method of claim 51 wherein patterns correspond to directions and scanning the [antenna beam of the direction-agile] antenna system in multiple [directions] patterns includes scanning in azimuth and elevation directions.

56. (AMENDED) The method of claim 51 wherein determining a [direction] pattern of the [antenna beam of the direction-agile] antenna system comprises:

detecting a [beam] pattern of a signal carrying a response to the request [over the] by scanning of the [direction-agile] antenna system.

57. (AMENDED) The method of claim 51, wherein determining the [direction] pattern of the [antenna beam of the direction-agile] antenna system comprises:

comparing one or more characteristics of a signal carrying a response to the request detected at different times during the scanning.

58. (AMENDED) The method of claim 51 further comprising:
monitoring characteristics of a signal received by the [direction-agile] antenna system,
determining if the characteristics meet predetermined criteria, and
if the predetermined criteria are met, scanning the [antenna beam of the direction-agile] antenna system in multiple [directions] patterns.

59. (AMENDED) The method of claim 51 further comprising:
monitoring characteristics of a signal received by the [direction-agile] antenna system as the [direction] pattern of the antenna system [beam] is changed and adjusting the [direction] pattern of the [antenna beam of the direction-agile] antenna system based upon the monitoring of the characteristics.

60. (AMENDED) The method of claim 51 further comprising:
if an expected signal is not received, scanning the [antenna beam of the direction-agile] antenna system in multiple [directions] patterns .

61. (AMENDED) The method of claim 51 wherein the [direction-agile] antenna system has a plurality of antenna elements and scanning the [antenna beam of the direction-agile] antenna system in multiple [directions] patterns comprises shifting the phases of signals [transmitted] received by different antenna elements of the [direction-agile] antenna system.

62. (AMENDED) The method of claim 61 wherein transmitting at least one request from the [direction-agile] antenna system comprises transmitting a request from all of the antenna elements.

63. (AMENDED) The method of claim 51 further comprising recording the determined [direction] pattern for later use.

64. (PREVIOUSLY PRESENTED) The method of claim 51 wherein the request is a polling request and the responses are transmitted according to the I.E.E.E. 802.11 standard.

65. (AMENDED) The method of claim 51 wherein the step of scanning the antenna system [beam] is carried out by first activating a first antenna element and reflector and then activating a second element and a reflector.

66. (PREVIOUSLY PRESENTED) A method for use in establishing and maintaining wireless communications using an antenna system with the capability to transmit and receive signals in a direction having a positive antenna gain and to vary that, the method comprising:

transmitting a communication from the antenna system;

electronically steering the antenna gain of the antenna system through multiple directions;

detecting a response signal to the communication while the antenna system is being steered through multiple directions;

selecting the direction of the antenna gain based upon at least one characteristic of the response signal received at different directions of the antenna gain; and

transmitting or receiving a signal from the antenna system in the selected direction.

67. (AMENDED) A method of improving a wireless communication link using [a] an [direction-agile] antenna system with the capability to transmit and receive signals in more than one pattern , the method comprising:

receiving one or more signals that request a response at the [direction-agile] antenna system [requests] from a device [requesting a data link] when the antenna system is configured in at least two different selected patterns ;

[scanning the direction-agile antenna in multiple directions;]

determining a [direction for the gain] pattern of the [direction-agile] antenna system based on the received [requests] signals; and

transmitting [or receiving a signal] a response to the one or more signals that request a response [at the direction-agile antenna] in the determined pattern [direction].

68. (AMENDED) The method of claim 67 wherein the one or more signals that request a response are requests for a data link [scanning the gain of the direction-agile antenna in multiple directions includes scanning in azimuth and elevation].

69. (AMENDED) The method of claim 67 wherein determining a direction for the gain of the [direction-agile] antenna system comprises:

detecting a beam pattern of the one or more signals that request a response [signal carrying the requests from a device requesting a data link].

70. (AMENDED) The method of claim 67, wherein determining a [direction for the gain] pattern of the [direction-agile] antenna system comprises:

comparing characteristics of the one or more signals that request a response which were received when the antenna system was configured in at least two different selected patterns [signal carrying the requests from a device requesting a data link] detected at different times during the scanning].

71. (AMENDED) The method of claim 67 further comprising:

monitoring characteristics of a signal received by the [direction-agile] antenna system.

72. (AMENDED) The method of claim 67 further comprising:

monitoring characteristics of a signal received by the [direction-agile] antenna system as the [direction] pattern of the antenna beam is changed.

73. (AMENDED) The method of claim 67 wherein the antenna system has a plurality of antenna elements and [scanning the gain of the direction-agile] configuring the antenna system [in multiple directions] in at least two different selected patterns comprises activating and switching off different antenna elements of the [direction-agile] antenna system.

74. (AMENDED) The method of claim 67 wherein the antenna system has a plurality of antenna elements and [scanning the gain of the direction-agile] configuring the antenna system in at least two different selected patterns [multiple directions] comprises shifting the phases of signals [transmitted] received by different antenna elements of the [direction-agile] antenna system.

75. (PREVIOUSLY PRESENTED) The method of claim 67 further comprising recording the determined direction for later use in communicating with the device.

76. (AMENDED) [A direction-agile]An antenna system for use in establishing and maintaining wireless data links, the system comprising:

an antenna having a plurality of antenna elements arranged for use as a phased array capable of selectively transmitting or receiving an electromagnetic signal in a plurality of patterns [directions]; and

a controller coupled to the antenna and configured to[:]

transmit polling requests through the antenna,

detect responses to the polling requests while the antenna is [oriented] configured in at least two different selected patterns,

determine a selected [direction] pattern of the antenna for transmitting or receiving based on the responses to the polling requests,

transmit a [direction control] signal to the antenna indicating the selected [direction] pattern of the antenna.

77. (PREVIOUSLY PRESENTED) The system of claim 76 wherein the controller comprises circuitry which is integrated with a surface on which at least one of the elements is disposed.

78. (AMENDED) The system of claim 76 wherein the controller is further configured to scan the antenna in multiple [directions] patterns and detect a beam pattern of a signal carrying a response to the polling requests over the scanning of the antenna.

79. (AMENDED) [A direction-agile] An antenna system for use in establishing and maintaining wireless data links, the system comprising:

an antenna system capable of selectively transmitting or receiving an electromagnetic signal in a plurality of directions; and

a controller coupled to the antenna system and configured to[:]

[receive via the antenna signals from a device requesting a data link,]

send a signal to the antenna system to cause it to orient its gain in multiple directions,

transmit polling requests through the antenna system,

detect responses to the polling requests while the antenna system is oriented in at least two different directions,

determine a selected direction for the orientation of the gain of the antenna system based on the [requests] responses received while the antenna system was oriented in at least two different directions [scanning], and

transmit a direction control signal to the antenna system indicating the selected direction for the orientation of the gain of the antenna system.

80. (AMENDED) The system of claim 79 wherein said antenna system comprises a plurality of elements and at least one of the plurality of elements is configured to transmit an electromagnetic signal in a different direction than another of the elements.

81. (AMENDED) The system of claim 80 wherein at least one of the elements is capable of being activated while other elements are switched off to transmit the electromagnetic signal in the selected direction of transmission of the antenna system.